



Application Program

1440/1460 Administrative Terminal System

Application Description

This system consists of control and functional programs that permit many different text-processing and data-handling activities to be carried on simultaneously through different terminals. This publication contains a general discussion of the features of the program, an indication of some of the areas in which it may be applied, and the machine configuration required.

PROGRAM ABSTRACT

The IBM 1440/1460 Administrative Terminal System consists of the control and functional programs that permit many different text-processing and data-handling activities to be carried on simultaneously through up to 40 different terminals. The terminals used are essentially IBM Selectric[®] typewriters. Disk storage is used to hold both working items and items to be recalled for use or modification. In addition, users may add programs to the system that will permit concurrent execution of simple peripheral operations such as card-to-tape and tape-to-printer.

The system has many functional capabilities. Some of these capabilities are:

- Enter information through a typewriter keyboard, with backspacing and retyping to correct errors.
- Replace a word, phrase, or sentence in text which has been entered or recalled from storage.
- Add or delete lines or sentences.
- Copy information.
- Transmit information to any other terminal or to a card punch or magnetic tape.
- Store and retrieve any defined set of information. Provision is made to prohibit unauthorized retrieval of information.
- Produce precisely formatted output from rough input, including such features as automatic page heading, footing and numbering, and right-margin justification, if desired. Free-form text and fixed-format information may be intermixed.
- Perform basic desk calculator functions — add, subtract, multiply, and divide.

SYSTEM DESCRIPTION

The IBM Administrative Terminal System consists of a unique combination of operating programs and an IBM 1440/1460 Data Processing System and related input/output equipment, especially prepared to handle text streams. A text stream is any combination of spaces, characters, words, sentences, or paragraphs in any sequence and entered at any period of time which may be required to be assembled as output. The output may be used directly, reproduced, or be read as input to be processed by a conventional data processing operation.

The Administrative Terminal System stores input information in the computer system and returns the information automatically as typewritten data upon demand. Simultaneous operation of a number of remote terminals is permitted, each of which may be handling a different application (see flowchart). The output may be formatted by specific editing processes selected by the terminal operator.

Typed or printed output is prepared in lines of a length designated by the operator. Right-margin justification may be selected as an option. Justification is implemented by analysis of the spaces between text words and placement of additional single spaces distributed across the line. Uniform captions may be inserted automatically at the top and bottom of each page. The pages are numbered if the operator so elects. Any number of sections of stored text may be obtained upon demand by the operator.

The backspace key is used to erase (cancel) erroneous data during the initial typing operation. Text in storage can be modified by the deletion or insertion of new words, phrases, sentences, and paragraphs.

Lines of fixed-format information or unit sections of free-form text designated by the typist are sequentially numbered in storage. This number sequence is automatically changed whenever the text is modified. Thus, a count of unit items is available as a tally for recordkeeping purposes.

Information placed into storage can be kept confidential by tagging the record block with a security code to prevent unauthorized access to, or accidental modification of, the stored data.

The system provides for the output of information at any terminal although the data may have been originally entered or revised at one or more different terminals. In addition, the Administrative Terminal System permits communication among the several terminals of a system by storing requests for output at specified terminals. The terminal operator may accept these requests whenever it is convenient to do so.

The primary concept of the Administrative Terminal System is to provide a typewriter which is an entry to a system for text stream processing. The operator's basic methods are not changed, but are enhanced by the capability of the system. The system assists in making certain that required items are present, allows the options of specifying parameters



which are necessary for the particular application, guides in correcting mistakes and in making text changes (insertions, deletions, etc.), and allows total or partial recall of any prior data at any time.

The usual input/output devices for an IBM 1440 or 1460 Data Processing System can be installed for regular operation as a data processing system. The availability of these devices permits magnetic tape and high-speed printer output. In cases when the output text must utilize both uppercase and lowercase characters, the use of a printer equipped with an upper-case/lowercase chain will reduce the loading of the typewriter-speed terminals.

The text processing and related functions described above are the building blocks out of which can be made a powerful and effective tool for many types of applications. An examination of the basic characteristics of text-processing applications reveals five general types of applications:

- Data assembly
- Automatic transcription
- Item count
- Source data entry
- Document processing

The data assembly applications actually consist of two classes: (1) organized data when the output is organized into logical sentences, paragraphs, pages, and tables, and (2) formatted data when the output is under control of predetermined positions required by the design of the form being prepared. The automatic transcription applications are those where accuracy and controlled transcription are prime requirements, such as tables, form letters, contracts, etc. The item count applications are described relative to operations where counts of existing text, lines, paragraphs, or items are essential, such as airline reservations, page counts, etc. The source data entry applications encompass direct data capture as a result of the preparation of original documents. This type of application includes source program entry for computers and may be a substitute for card punching and verifying in some instances. The last general type of application involves document reprocessing where parts of the text are added at various points in time and a document printout is required when all parts are complete and available, as in the case of service orders, credit reports, etc. Most specific applications will actually take advantage of some features normally associated with other types of applications. Some of these specific applications are listed in the following paragraphs.

ADMINISTRATIVE TERMINAL SYSTEM APPLICATIONS

The IBM Administrative Terminal System provides a new concept for the production of large-volume transcriptions. Text is held in accessible storage while copy is proofread and edited. The typist then revises the stored text by means of program-controlled deletion and insertion. Manual retyping of corrected drafts and of final text is eliminated. Typical applications are in the areas of:

- Technical writing
- Publishing
- Proposal writing
- System and procedure documentation
- Specification writing for engineering and purchasing
- Price list preparation
- Contract preparation and management
- Preparation of legal briefs
- Preparation of legislative bill drafts

The Administrative Terminal System provides a correction method which utilizes the addressable text storage to increase efficiency and accuracy in the preparation of documents which may have widely varying formats and contain highly technical material. Since the text must be absolutely accurate, careful proofreading and correction are required. However, once the accurate text has been stored, additions and corrections can be readily accomplished with no need for the entire page to be proofread again. Further, since the original errors are so easily corrected, the initial text will require less retyping. Examples of output which may require such accuracy and changes are:

- Purchase orders
- Personnel records
- Manufacturing orders
- Engineering change orders
- Executive correspondence
- Data file maintenance

The Administrative Terminal System automatically places all data in random access storage. Text retrieval is simple, and the response is fast. Controlled accuracy and increased production are ensured by the retrieval of prechecked form-letter statements, codicils, and tables. Examples of such applications are:

- Price quotations
- Sales promotion and other form letters
- Accounts receivable follow-up
- Audit correspondence
- Acknowledgment letters

The line-count and unit-count features of the Administrative Terminal System can be used as a means of item tally. The number of entries made or remaining in individual groups is continuously compiled. Some applications are:

- Reservation processing
- Expediting and stock chasing
- Planning

The Administrative Terminal System is particularly useful in procedures that require the typing of information on documents in two or more separate operations. Often there is a procedural need for status control over the activities represented by the documents. Status control reporting is automatically accomplished by a printout of the stored information. Typical areas of use are:

- Service and maintenance reports
- Document or equipment chargeout control
- Material test procedures and reports
- Credit reports

The Administrative Terminal System can be used for source data entry. Information is entered at the keyboard; it can then be printed, modified, and manipulated by the terminal operator. Finally, these data can be processed as tape output or as hard copy on the 1403 Printer. The uppercase/lowercase chain (an optional feature) may be used for producing, at high-speed, printed output of material for publication. Pertinent applications include:

- Computer program preparation
- Technical research data collection
- Test data record preparation

The many capabilities embodied in the system provide a complete and dramatic solution to the processing of these applications in all industries.

FUNCTIONAL SPECIFICATIONS

The system is a multiterminal, multiapplication, real-time processor with time-sharing capabilities. A keyboard terminal is the basic input device. Key combinations supply control to the system. Output is provided by typewriter, printer, tape deck, disk, or card punch. Maximum record lengths on tape or disk are dependent upon the amount of buffer area needed for terminals and the amount of core storage used for other resident programs. Features included in the program are given below.

Basic Functions

1. Data Entry. Information can be manipulated by line or by unit when a unit is of any length and is defined by a double carriage return. The user can manipulate information in the following ways:
 - a. Corrections
 - (1) Backspace and retype during entry
 - (2) Retype beginning with a particular word
 - (3) Replace a word or phrase
 - (4) Add to a line or unit
 - (5) Delete a line or unit
 - (6) Insert a line or unit
 - b. Data Moves
 - (1) Store and retrieve information from file
 - (2) Gather stored data in any sequence
 - (3) Transmit to any other terminal
 - (4) Copy information by transmission to the originating terminal
2. Output Edit
 - a. Limit free-form text lines to a length specified from the terminal
 - b. Justification of right-hand margins
 - c. Intermix of free-form text with fixed-format information
 - d. Page headings, title or chapter headings on all pages of a document
 - e. Placement of specified lines at the foot of each page of a document
 - f. Automatic numbering of document pages at top and/or bottom
 - g. Controlled vertical spacing of the output document
 - h. Halt to allow the operator to change typewriter balls, or for other required manual action

Extended Functions

1. Data capture ability for large installations of keypunches and key verifiers.
2. Capability for program card control for large programming groups and to assemble sections of the programs and selected test decks. Special functions provided for this type of activity are automatic duplicate and sequence numbering and a field definition.
3. Basic desk calculator functions — add, subtract, multiply, and divide.

4. A store-and-forward communication capability both from and to any and all terminals on the system
5. Capability of performing normal peripheral operations simultaneously, such as card-to-tape and tape-to-printer

Timing

Basic timing factors are:

- Typewriter output: 14.8 characters per second
- Typewriter input: as fast as a person can type
- Card read: up to 600 cards per minute
- Card punch: causes system delays with a 1402 Card Read Punch
- Tape input/output: approximately 80% of maximum throughput on peripheral operations
- Printer: up to 1,100 lines per minute

The ability of the system to do peripheral work depends upon the amount of core storage available, which is in turn determined by the maximum number of active terminals on the system and the mix of operations being performed by active terminals. The criterion which must be satisfied to do any input/output operation is that the operation will never require more than 100 milliseconds of computer interlock time. Information for proper interfacing of customer-written peripheral programs is provided with the system documentation.

Terminal response depends upon the number of active terminals and upon what functions are being called for at any one time. The major factor is the required access time to the disk files. Occasional delays may occur.

PROGRAMMING SYSTEM

The system is coded using the 1440/1460 Disk Autocoder (1401-AU-008).

MACHINE REQUIREMENTS

Basic System

TERMINALS

The Administrative Terminal System uses either IBM 1052 Model 2 Printer-Keyboards or modified IBM Selectric® I/O Typewriter terminals. (Note: Terminal types cannot be mixed.)

Each 1052 terminal requires the following units and RPQ features:

One IBM 1052, Model 2	Printer-Keyboard with correspondence keyboard
RPQ feature 815147 }	{ Administrative Terminal
RPQ feature 815148 }	{ System features
One IBM 1051, Model 2	Control Unit
RPQ feature W13317	Administrative Terminal
	System feature

Each typewriter terminal requires the following

One RPQ feature W09330	Modified Selectric I/O Typewriter
One 1051 Model 2	Control Unit
RPQ feature 815098	RPQ W09330 Attachment feature

Depending upon the type of communication service connecting the terminal with the computer, an IBM modern (feature 4790 on the 1051) or a common-carrier modern may be required. See your IBM data processing sales representative for information concerning these requirements

COMPUTER SYSTEM

The Administrative Terminal System can use either of two central processing units. A basic IBM 1440 system requires one IBM 1441, Model A6, Processing Unit (16,000 positions of core storage). A basic IBM 1460 system requires one IBM 1441, Model B6, Processing Unit (16,000 positions of core storage).

Either of these 1441 Processing Units requires the following special features: Bit Test, Console Attachment, Direct Seek, Disk Storage Control, Indexing and Store Address Register, Seek Overlap Adapter, Transmission Control Unit Attachment.

The following units and features are also required for a basic system:

- One IBM 1311, Model 1, Disk Storage Drive with Direct Seek and Seek Overlap
- One IBM 1316, Model 1, Disk Pack
- One IBM 1447, Model 1, Console with Sense Switches
- One IBM 1447, Model 4, Console
- One IBM 1448, Model 1, Transmission Control Unit with Attachment Feature 1050/1060
- Feature 1275

- RPQ feature 815099. This feature includes a provision for attaching one group of up to ten lines.
- RPQ feature 815121. This feature is required for each additional group of ten lines, up to a maximum of three additional groups.
- Feature 2070, Common Carrier Adapter Set 1050/1060
- Feature 4791, Line Adapter Set 1050/1060. Either this feature or feature 2070 is required for each one of two lines, up to a maximum of five per line group and 20 in all. If modems are required for any terminal, the coordinate modem must be installed at the 1448 Transmission Control Unit. See your IBM data processing sales representative for information concerning these requirements.

Some method of program loading must also be supplied. This may be a peripheral card reader (as described in the following section) or another IBM 1440, 1401, or 1460 system that can load the program on an IBM 1316 Disk Pack to be mounted on one of the IBM 1311 Disk Storage Drives on this system.

Optional System Features

ADDITIONAL DISK STORAGE

One or more additional disk storage units are required for the most effective operation of the system. These may include up to four IBM 1311 Disk Storage Drives with IBM 1316 Disk Packs. From one to five arrays of IBM 1301 Disk Storage modules may be used either instead of or together with the additional IBM 1311 Disk Storage Drives. The IBM 1301 must have two 1311 Disk Storage Drives installed.

HIGH-SPEED PRINTING

One printer may be attached to the system to serve as a high-speed output terminal. On a 1440 system an IBM 1443 Printer with the 24 Additional Print Positions and Print Storage features may be used. On a 1460 system an IBM 1403 Printer with the Print Storage feature may be used.

Instead of a regular IBM 1403 Printer on a 1460 system, a special printer may be attached which will permit both uppercase and lowercase letters and an expanded set of special characters at approximately 300 lines per minute. Feature 1376, Auxiliary Ribbon Feeding for polyester film ribbon, is recommended where output will be used for direct reproduction. Those characters that are not on the 1052 terminal keyboard will be entered by a multiple keystroke procedure.

To permit installation of uppercase and lowercase printing capabilities, specific systems will require the following RPQ features:

On the IBM 1441, Model B6, RPQ feature E27588; on the IBM 1403, Model 2, RPQ features 812033 and 812034. In addition, RPQ feature E32574 on the IBM 1403, Model 2, is required to provide the 120 characters of uppercase and lowercase Courier type, including special characters.

TRANSLATE FEATURE

The system uses this feature (number 8023) on the 1441 Processing Unit, if installed or if present, in the following functions:

1. Uppercase and lowercase printing
2. Loading documents from punched cards
3. Preserving information on magnetic tape

Its presence will significantly reduce the central processing unit time required for these functions.

MAGNETIC TAPES

One magnetic tape drive may be attached to the system to serve as a high-speed output terminal. A magnetic tape written on this drive may be used by another system as input for processing. On a 1440 system, an IBM 7335 Magnetic Tape Unit may be used. On a 1460 system, either an IBM 729 or an IBM 7730 Magnetic Tape Unit may be used.

CARD PUNCHING AND READING

One card punch or card read punch may be attached to the system to prepare punched cards. These may be either in a format prespecified by the user or in a special format suitable for storing information to be read back into disk storage at a later date. On a 1440 system, an IBM 1442 Card Read Punch, Model 1 or Model 2, will provide this capability. On a 1460 system, an IBM 1402 Card Read Punch, Model 3, will provide this capability.



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